IN THE CLAIMS:

The claims are pending as follows:

1. (Withdrawn) A horizontal optical resonator type laser diode having an optical resonator horizontally with respect to a substrate surface, comprising:

a substrate of a semiconductor;

an active layer formed inside the semiconductor;

an optical resonator mirror formed on a semiconductor facet; and

a reflection film comprising a first insulator film formed in contact with the semiconductor facet as the optical resonator mirror and an insulator film layered on the first insulator film;

wherein the first insulator film comprises aluminum oxide lacking in oxygen and composition of aluminum oxide is Al_2O_{3-x} where $0.03 \leq x \leq 0.3$.

2. (Withdrawn) A laser diode according to claim 1, wherein composition of the aluminum oxide is Al_2O_{3-x} where $0.1 \leq x \leq 0.2$.

3. (Currently Amended) A laser diode according to claim 1 [[or 2]], wherein the active layer comprises a material containing aluminum.

4. (Withdrawn) A laser diode according to claim 3, wherein the aluminum content of the active layer has a compositional ratio of 10 at% or more relative to a group III element.

5. (Withdrawn) A laser diode according to claim 1, wherein an InP substrate is used for the semiconductor substrate.

6. (Withdrawn) A laser diode according to claim 1, wherein the first insulator film is aluminum oxynitride formed by adding aluminum nitride to an aluminum oxide film lacking in oxygen.

7. (Withdrawn) A laser diode according to claim 1, wherein total stress of the reflection film

defined by a sum of products of film thicknesses and internal stresses for all the layers is 150 Pa·m or less.

8. (Withdrawn) A laser diode according to claim 1, wherein total stress in the reflection film is 100 Pa·m or less.

9. (Original) A method of manufacturing a horizontal optical resonator type laser diode having an optical resonator horizontal with respect to a substrate surface comprising the steps of:

providing a substrate of a semiconductor;

forming an active layer inside the semiconductor;

forming an optical resonator mirror on a facet of the semiconductor; and

forming a first insulator film in contact with the semiconductor facet as the optical resonator mirror and forming a reflection film formed by depositing an insulator film on the first insulator film;

wherein the first insulator film comprises aluminum oxide lacking in oxygen and the composition of an aluminum oxide is Al_2O_{3-x} where $0.03 \leq x \leq 0.3$.

10. (Original) A method of manufacturing a laser diode according to claim 9, further comprising the steps of:

a facet protection film or a facet reflection film having an aluminum oxide film lacking oxygen as a first layer on the semiconductor facet forming the optical resonator mirror; and

depositing the aluminum oxide film by a reactive sputtering method or an ion beam sputtering method of irradiating a metal aluminum target with plasma or ionic beams by using a gas mixture of an argon gas and an oxygen gas thereby causing film depositing reaction.

11. (Original) A method of manufacturing a laser diode according to claim 9, wherein the aluminum oxide film is deposited such that composition of argon intruded into aluminum

oxide is 1 at% or less.

12. (Withdrawn) A semiconductor laser diode module wherein at least an optical lens for collecting light, an optical fiber for leading light to the outside and the laser diode having an optical resonator horizontally with respect to a substrate surface, comprising: a substrate of a semiconductor; an active layer formed inside the semiconductor; an optical resonator mirror formed on a semiconductor facet; and a reflection film comprising a first insulator film formed in contact with the semiconductor facet as the optical resonator mirror and an insulator film layered on the first insulator film; wherein the first insulator film comprises aluminum oxide lacking in oxygen and composition of aluminum oxide is Al_2O_{3-x} where $0.03 \leq x \leq 0.3$ are integrated.

13. (Withdrawn) A laser diode according to claim 2, wherein the active layer comprises a material containing aluminum.

14. (Withdrawn) A laser diode according to claim 13, wherein the aluminum content of the active layer has a compositional ratio of 10 at% or more relative to a group III element.

15. (Withdrawn) A laser diode according claim 2, wherein total stress in the reflection film is 100 Pa·m or less.

16. (Withdrawn) A laser diode according to claim 3, wherein total stress in the reflection film is 100 Pa·m or less.

17. (Withdrawn) A laser diode according to claim 13, wherein total stress in the reflection film is 100 Pa·m or less.

18. (Withdrawn) A laser diode according to claim 4, wherein total stress in the reflection film is 100 Pa·m or less.

19. (Withdrawn) A laser diode according to claim 14, wherein total stress in the reflection film is 100 Pa·m or less.

20. (Withdrawn) A laser diode according to claim 5, wherein total stress in the reflection film is 100 Pa·m or less.

21. (Withdrawn) A laser diode according to claim 6, wherein total stress in the reflection film is 100 Pa·m or less.